Fonn 3160-5
(August 2007)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010

**SUNDRY NOTICES AND REPORTS ON WELLS**

***Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.***

***SUBMIT IN TRIPLICATE - Other instructions on reverse side.***

5. Lease Serial No.
142002581310

6. If Indian, Allottee or Tribe Name
WIND RIVER

7. If Unit or CA/Agreement, Name and/or No.
CA582

1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.
TR PAV 32-2

2. Name of Operator
ENCANA OIL AND GAS (USA) INC
Contact: TANNER J MESSER
E-Mail: tanner.messer@encana.com

9. API Well No.
49-013-22245-00-S1

3a. Address
370 17TH ST STE 1700
DENVER, CO 80202

3b. Phone No. (include area code)
Ph: 720-876-5014
Fx: 720-876-6014

10. Field and Pool, or Exploratory
PAVILLION

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 2 T3N R2E Tract 2 1980FNL 1980FEL

11. County or Parish, and State
FREMONT COUNTY, WY

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

| TYPE OF SUBMISSION | TYPE OF ACTION | | | |
|---|---|---|---|---|
| ☒ Notice of Intent | ☐ Acidize | ☐ Deepen | ☐ Production (Start/Resume) | ☐ Water Shut-Off |
| ☐ Subsequent Report | ☐ Alter Casing | ☐ Fracture Treat | ☐ Reclamation | ☐ Well Integrity |
| ☐ Final Abandonment Notice | ☐ Casing Repair | ☐ New Construction | ☐ Recomplete | ☒ Other Well Test |
| | ☐ Change Plans | ☐ Plug and Abandon | ☐ Temporarily Abandon | |
| | ☐ Convert to Injection | ☐ Plug Back | ☐ Water Disposal | |

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

Encana Oil & Gas performed the following bradenhead test:
Excavate cellar to expose bradenhead valve.
Install test riser and valve.
Open testing valve and record bradenhead pressure.
If any pressure is observed, continue bradenhead testing in accordance with the attached detailed procedure.
Also record flowing or shut in tubing pressure, and casing pressure.

Results of the bradenhead test were as follows.
Flowing tubing pressure 40 psi.
Shut in casing pressure 136 psi.
Initial bradenhead pressure 150 psi.

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14. I hereby certify that the foregoing is true and correct.
**Electronic Submission #131854 verified by the BLM Well Information System**
**For ENCANA OIL AND GAS (USA) INC, sent to the Lander**
**Committed to AFMSS for processing by MELANIE LEAVENWORTH on 02/29/2012 (12MKL0838SE)**

Name *(Printed/Typed)* TANNER J MESSER — Title OPERATIONS ENGINEER

Signature (Electronic Submission) — Date 02/28/2012

**THIS SPACE FOR FEDERAL OR STATE OFFICE USE**

Approved By ACCEPTED — RICHARD VANDER VOET, Title FIELD MANAGER — Date 03/09/2012

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. — Office Lander

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

EPAPAV0032912

## Additional data for EC transaction #131854 that would not fit on the form

**32. Additional remarks, continued**

Well blew down, no fluid recovered.
24 hr shut in bradenhead pressure 65 psi.
7 day shut in bradenhead pressure 160 psi.

Encana would like to perform further bradenhead testing as follows:
Flowback bradenhead 15 days to a 400 barrel open top tank.
Record tubing pressure, casing pressure, bradenhead pressure and daily flow rate for gas and liquids.
Take a gas sample from the bradenhead.
If any liquids are present, take a liquid sample from the bradenhead.
Shut in bradenhead and allow bradenhead pressure to build.
Record tubing, casing and bradenhead pressures after 24 hours and again after 7 days.
Take a gas and liquid sample from the production string.

Extended flow test results along with the sample results will be submitted via sundry.

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**Revisions to Operator-Submitted EC Data for Sundry Notice #131854**

| | Operator Submitted | BLM Revised (AFMSS) |
|---|---|---|
| Sundry Type: | TEST<br>NOI | TEST<br>NOI |
| Lease: | 142002581310 | 142002581310 |
| Agreement: | | CA582 (CA582) |
| Operator: | ENCANA OIL & GA<br>370 17TH STREET, SUITE 1700<br>DENVER, CO 80202<br>Ph: 720-876-5014 | ENCANA OIL AND GAS (USA) INC<br>370 17TH ST STE 1700<br>DENVER, CO 80202<br>Ph: 303.623.2300 |
| Admin Contact: | TANNER J MESSER<br>OPERATIONS ENGINEER<br>E-Mail: Tanner.Messer@Encana.com<br>Cell: 307-421-3958<br>Ph: 720-876-5014<br>Fx: 720-876-6014 | TANNER J MESSER<br>OPERATIONS ENGINEER<br>E-Mail: tanner.messer@encana.com<br>Cell: 307-421-3958<br>Ph: 720-876-5014<br>Fx: 720-876-6014 |
| Tech Contact: | TANNER J MESSER<br>OPERATIONS ENGINEER<br>E-Mail: Tanner.Messer@Encana.com<br>Cell: 307-421-3958<br>Ph: 720-876-5014<br>Fx: 720-876-6014 | TANNER J MESSER<br>OPERATIONS ENGINEER<br>E-Mail: tanner.messer@encana.com<br>Cell: 307-421-3958<br>Ph: 720-876-5014<br>Fx: 720-876-6014 |
| Location:<br>State:<br>County: | <br>WY<br>FREMONT | <br>WY<br>FREMONT |
| Field/Pool: | PAVILLION | PAVILLION |
| Well/Facility: | TRIBAL PAVILLION 32-02 32-02<br>Sec 2 T3N R2E SWNE 1980FNL 1980FEL<br>43.267230 N Lat, 108.582780 W Lon | TR PAV 32-2<br>Sec 2 T3N R2E Tract 2 1980FNL 1980FEL |

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June 2, 2011

# Pavillion Bradenhead Testing Procedure

## Discussion and Background

**1.0** Geologic formation – The surface formation in Pavillion is the Wind River Formation. This formation is the source for domestic water wells in the field as well as producing natural gas. This formation extends to a depth of approximately 3300'. The Fort Union Formation lies below the Wind River and is also a natural gas producing horizon. Fort Union production extends down to a depth of approximately 5500'.

**2.0** Reservoir pressures – Extensive data in the field shows the Wind River and Fort Union formations to be normally pressured with a pore pressure gradient of .435 - .44 psi per foot of depth.

**3.0** Fracture gradients –

**3.1** Fort Union - ISIP data shows the Fort Union to have an average frac gradient of approximately 0.7 psi per foot of depth and can range from 0.45 psi/ft to 0.9 psi/ft. This gradient is fairly constant throughout the Fort Union.

**3.2** Wind River – ISIP data tells a significantly different story for the Wind River Formation where frac gradients are increasing as depth decreases. Average values start at 0.85 psi/ft at 3000 ft and increase to 1.1 psi/ft at 1300 ft.

**3.3** Leak off data is extremely rare in this field, however, one data point was found for the Tribal Pavillion 15-21X where a leak off test was performed out from under the surface casing and resulted in a leak off frac gradient of 1.15 psi/ft at 849 ft.

**4.0** The Critical Pressure is a calculated reference point that represents what the maximum allowable surface pressure can be before remediation is needed. This critical pressure will be calculated using the difference between 0.65 (assumed maximum allowable bottom hole pressure gradient) and 0.47 (assumed hydrostatic column gradient), or 0.18 psi/ft multiplied by the surface casing depth. Gradients explained below.

| Depth | Crit Pres |
|---|---|
| 500 ft | 90 psi |
| 600 ft | 108 psi |
| 700 ft | 126 psi |

Figure 1

**4.1** For the purpose of bradenhead testing, the maximum allowable bottom hole pressures will be determined using a gradient of 0.65 psi/ft. This is almost half of the observed and expected frac gradients at the surface casing shoe depth in the producing wells, giving a significant degree of safety.

**4.2** No well had higher than 9 ppg mud weight, so assume that is the weight of fluid in the annulus. Formation water is usually less than 8.5 ppg. A 9 ppg mud has a gradient of 0.47 psi/ft.

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**4.3** Observed frac gradients in the Pavillion field are shown in Figure 2.

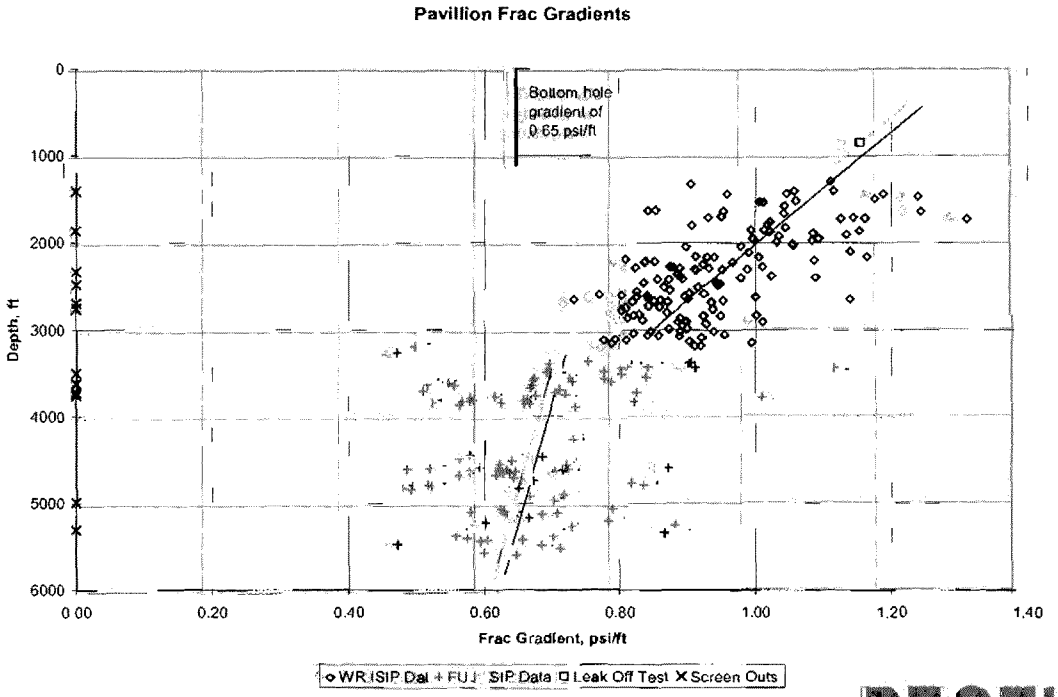


Figure 2

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## Procedure

**5.0 Record Bradenhead Pressure**

**5.1** Conduct Job Safety Analysis (JSA)
**5.1.1** Include all steps, hazards and mitigations for this procedure.

**5.2** Review ground disturbance policy and fill out ground disturbance form if the Braden Head Valve is buried.

> **NOTE**
> One person must have Ground Disturbance Supervisor training and be on location when excavation occurs.

**5.3** If the Braden Head Valve is buried excavate cellar by hand to expose the 2" ball valve. remove existing 2" ball valve plug Note: if plug cannot be removed i.e.... rusted in place, contact supervisor.

> **NOTE**
> If a building must be removed to find this valve notify Encana production supervisor for permission to proceed.

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**5.4** Clean threads and install the pressure test assembly consisting of bull plug, needle valve and pressure gauge.

**5.4.1** Verify needle valves are closed with a plug in the bleed port, and bleed port is facing down.

**5.5** Open valves and record shut in pressure.

**5.6**

**5.7**

**5.8**

**NOTE**

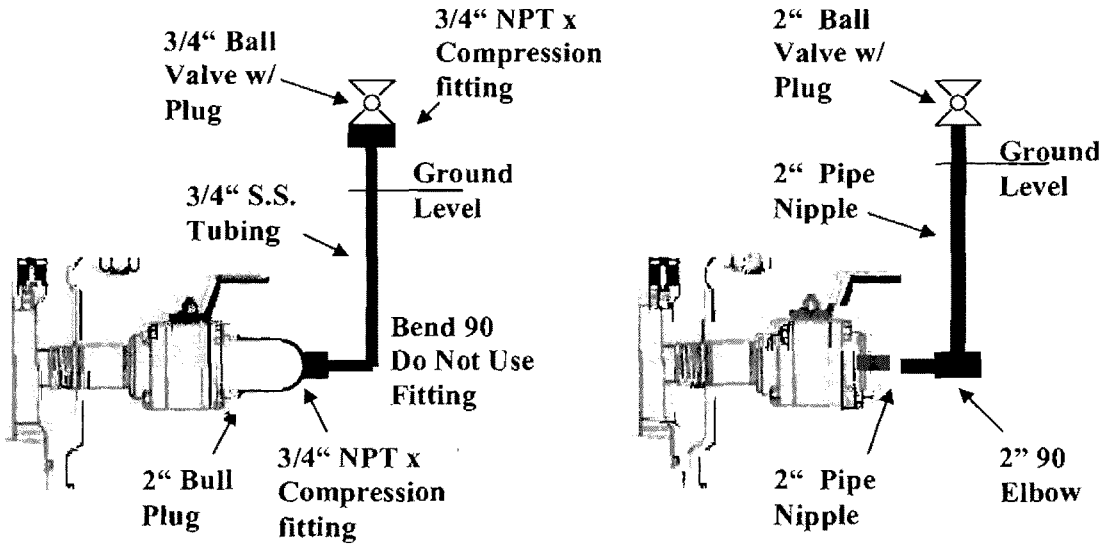
If the 2" Braden Head valve will not open notify the Encana production supervisor and await further instruction.

**5.9** Close valves and bleed liquids into environmental containment

**5.10** If no pressure is observed, remove pressure test assembly install a tapped bull plug with 1/4" plug using anti-seize paste and fill in cellar.

**5.11** If pressure is observed, but less than 60 psi, install a 3/4" tubing test riser. See Figure 3.

**5.12** If recorded pressure is greater than 60 psi, install a 2" pipe test riser. See Figure 3.




3/4" Tubing Test Riser

2" Pipe Test Riser

FIGURE3. Test Riser

**6.0 Test procedure for pressures less than 50% of critical pressure. (See steps 7.0 or 8.0 if pressures are higher).**

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**6.1** For wells that are less than 50% of it's critical pressure. A one time bleed test will be performed.

**6.2** Add a ¾" blow down line with adequate liquids containment and bleed pressure off well.

**6.3** Shut in and record pressure every 5 min for 30 min, then at 1 hour and 24 hours.

**6.4** If pressures exceed the 50% limit, move to step **7**.2, if not, monitor pressure monthly for six months, then annually thereafter to ensure it does not exceed the 50% limit.

**7.0 Test procedure for wells between 50% and 100% of critical.**

**7.1** Install 2" blow down with line with adequate containment.

**7.2** Bleed pressure off well.

**7.3** Shut in and record pressure every 5 min for 30 min, then at 1 hour, 24 hours and 7 days.

**7.4** If pressures stay below the 50% limit, follow step 6.0

**7.5** If pressures continue to build above the 50% limit, conduct an extended flow test (daily monitoring) in an effort to relieve downhole pressure. Collect and sample any liquids.

**7.6** If the flow dies, shut in a monitor pressures as above.

**7.7** If gas continues to flow, collect a gas sample and have analyzed (to compare to downhole gas sample). Proceed to step 8.0.

**8.0 Test procedure for wells above 100% of critical.**

**8.1** Conduct bleed test described in step 7.0.

**8.2** If pressures decline, follow procedures outlined in steps 6.0 or **7**.0 as applicable.

**8.3** If a constant gas or water flow is observed, or pressures continue to build above 100% of critical, develop a detailed wellbore history and diagram and discuss next steps with WOGCC/BLM. Collect gas and liquid samples for analysis.

**8.3.1** Next steps might include flowing temperature logs to determine the source of flow, cement bond logs, and/or cement squeezing.

**9.0 End of procedure.**

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